Endoscopic Obliteration of Gastric Varices

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Received 2 October 2012; Revision submitted 2 October 2012; Accepted 16 October 2012

Abstract

Gastric varices are present in 5–33% of patients with portal hypertension and have a reported bleeding incidence of approximately 25% in 2 years. Gastric varices are more common in patients with noncirrhotic portal hypertension and extrahepatic portal vein obstruction. The risk of bleeding from gastric varices is lower than that of esophageal variceal bleeding but is generally more severe, and the associated mortality is significantly higher.

The management of gastric varices remains a therapeutic challenge. Because there are few controlled clinical trials, the strength of the evidence underlying guidelines for management of gastric varices is weaker compared to their esophageal counterparts.

Traditional endoscopic sclerotherapy is ineffective because gastric varices are usually associated with a gastrorenal shunt or a gastrocaval shunt resulting in outflow into the systemic circulation and high flow rate with a resultant rapid escape of sclerosant into the systemic circulation, delayed onset of local thrombosis, and a higher risk of distal serious complications.

Obturation or obliteration is the term used for gastric varices treated with glue rather than eradication, as the varix itself can remain visible even when effectively treated, as will be demonstrated in the video. This article is part of an expert video encyclopedia.

Keywords

Gastric varices; Obliteration; Obturation; Standard endoscopy; Video.

Video Related to this Article

Video available to view or download at doi:10.1016/S2212-0971(13)70054-2

Materials

The required accessories consist of:

Tissue adhesives such as *N*-butyl-2-cyanoacrylate or isobutyl-2-cyanoacrylate are used instead of the usual sclerosants because of the rapid polymerization on contact with living tissues.

- 2 or 3 ml prefilled syringes; Sri Maruthi Enterprises, Coimbatore, Tamil Nadu, India.
  - Saline.
  - Lipiodol.
  - *N*-butyl-2-cyanoacrylate:lipiodol mixture (1:1 or 1:1.5).
- Injector needle; Guerbet LLX, Bloomington, IN, USA.
- Three-way stopcock; Guerbet Group, Roissy, France.

Background and Endoscopic Procedures

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Key Learning Points/Tips and Tricks

The most important concept to discuss is the use of what is known as the 'sandwich technique.'

First, the dead space of the injector catheter is determined, which is usually anywhere between 1.5 cc and 2 cc, and then the injector catheter is filled with lipiodol, followed by a combination or mixture of cyanoacrylate and lipiodol at a 1:1 or 1:1.5 ratio, followed by a volume of lipiodol.

Following penetration of the varix, the injector volume is injected into the varix, the needle is withdrawn, and a saline flush is used to empty out the injector catheter.

It is important to avoid any direct contact of the glue with the scope and the instrument channel. This is done by careful and complete flushing of the injector after each injection.

Scripted Voiceover

Time (min:sec)	*Voiceover text*
00:01	Hi my name is Ala Sharara. In this short video I will review with you the endoscopic management of gastric varices, namely the endoscopic obliteration or obturation of gastric varices.
00:14	In this slide, I have listed for you some important points regarding gastric varices; it is important to note however that the management of gastric varices remains a therapeutic challenge. Because there are few controlled clinical trials, the strength of the evidence underlying the guidelines for management of gastric varices is weaker compared with their esophageal counterparts.
00:35	It is important first to start with a quick discussion of the classification of gastric varices. There are few proposed classifications, but the one that is most used in practice is the one proposed by Sarin, which is shown here, and is the one recommended by the Baveno consensus working group. It classifies varices on the basis of their location and their relationship to esophageal varices.
00:59	The type 1 varices extend along the lesser curvature and account for about 70% of gastric varices and those are usually managed as esophageal varices. Gastroesophageal varices (GOV) type 2 extends along the fundus. While isolated gastric varices (IGV) can be seen in the fundus or at ectopic sites in the stomach or the first part of the duodenum.
01:26	The principle of variceal obliteration with tissue adhesives is essentially simple and similar to the conventional sclerotherapy. This is a list of the accessories that are needed for use. Tissue adhesives such as N-butyl-2-cyanoacrylate or cyanoacrylate, for short, are preferred over the usual sclerosant because of their rapid polymerization on contact with blood or living tissue. Of note, N-butyl-2-cyanoacrylate is commonly used in Europe and Asia but is not available in the US. However, however a similar agent, 2-octyl cyanoacrylate has been approved by the FDA for skin closure and has also been used for the management of gastric varices.
02:11	One of the techniques used for the obliteration of gastric varices employs the so-called ''Sandwich technique''. First, the dead space of the injector catheter is determined, usually anywhere between 1.5 and 2 mL and then the injector catheter is filled with lipiodol, followed by a combination or a mixture of cyanoacrylate and lipiodol at a 1:1 or 1:1.5 ratio, followed by a volume of lipiodol. Following penetration of the varix, the injector volume can be emptied into the varix, the needle is withdrawn, and then saline flush is used to empty out the injector catheter. This step can be repeated for every injection as needed. Another technique is the prefilling of the injector sheath with cyanoacrylate and lipiodol mixture this can be useful for repeated injections or in the case of active bleeding and the catheter can be flushed between injections with saline.
03:19	The patient shown in this video is a young woman with myelofibrosis and myelodysplastic syndrome with massive splenomegaly, portal vein thrombosis, and portal hypertension. She had a history of esophageal variceal bleeding in the past controlled with band ligation and medical therapy and recently presented to an outside hospital with massive upper GI bleeding where an upper endoscopy noted: minimal proximal esophageal varices but multiple large gastric varices.
03:45	These large varices are identified on examination today. The options for endoscopic therapy here include obliteration with tissue adhesive and possibly band ligation. The use of traditional endoscopic sclerotherapy is ineffective because gastric varices are usually associated with a gastro-renal shunt or a gastro-inferior vena cava shunt resulting in rapid outflow into the systemic circulation and any sclerosant that can be injected will rapidly escape into the systemic circulation with the delayed onset of local thrombosis. Band ligation can be effective in acute management, however studies have shown that it is inferior to tissue adhesive injection because of its higher rate of re-bleeding.
04:33	In this case, we decide to do obliteration using tissue adhesives. As soon as the needle is primed with the injection solution, using the sandwich technique, then the varix can be approached and punctured and the volume inside the sheath of lipiodol followed by the lipiodol and cyanoacrylate as a mixture and then lipiodol, is injected inside the varix and the needle is withdrawn into the sheath and retracted and the needle can be flushed with saline. Upon refraction of the needle there is sometimes a little bit of oozing, which is usually transient. There have been reports of rare episodes of the needle being stuck inside the polymerized glue and this depends on how quick the polymerization happens, so it's preferred to have a ''not too quick'' polymerization. There is minimal oozing and this has stopped. One could see the varix here has been obliterated with some evidence of glue particles that are exuding from the injection site.
05:45	A week later, that varix has been obliterated and the examination shows the other two variceal columns and the fundus which are injected and obliterated using the same technique in sequence. Between injections the needle is withdrawn and flushed completely with saline and primed again with the injection material after using the sandwich technique.
06:10	Ten days later, examination shows that these varices have been obliterated. The varices can always be seen, however they now have a hardened cast inside of them because of the polymerization with the glue. This is demonstrated here by touching the varix with a blunt biopsy forceps here showing the hard nature of the variceal content.
06:34	Upon close inspection we can see that on either side of this large obliterated varix there are still parts that have not been completely obliterated. This will be demonstrated here with the blunt tip of the injector catheter touching upon that end of the varix showing its soft nature as compared to the hardened obliterated part of the varix. It was decided, therefore, to inject this part of the varix with the cyanoacrylate and lipiodol combination. The varix is punctured and is injected with the mixture. There is movement here and the needle has been ejected from the varix with some active bleeding.

This was controlled with repeated injections and obliteration of this part of the varix is also achieved with the injection.

07:52 A final and important point in the tissue glue obliteration of gastric varices, is to limit the volume of injections and to use a standardized injection technique and regimen to avoid accidental obliteration of the endoscope channel as well as local and systemic complications.